

SCIENCE EDUCATION

VOLUME 75 1991 CONTENTS AND AUTHOR INDEX



A WILEY-INTERSCIENCE PUBLICATION

JOHN WILEY & SONS, INC.

New York / Chichester / Brisbane / Toronto / Singapore

ISSN 0036-8326

SCIENCE EDUCATION

EDITOR

Leopold E. Klopfer

University of Pittsburgh

Learning Research and Development Center

Pittsburgh, Pennsylvania 15260

ASSOCIATE EDITOR

Richard Duschl

Department of Instruction & Learning

School of Education

University of Pittsburgh

Pittsburgh, Pennsylvania 15260

Assistant to the Editor: Sofia Kesidou

Special Section Editors

Thomas P. Evans, *Science Teacher Education*

Glen S. Aikenhead, *Issues & Trends*

Warren T. Wollman, *Learning*

Heidi Kass and Ronald Raven, *International Science Education*

Editorial Board

Glen S. Aikenhead

University of Saskatchewan

Patricia E. Blosser

Ohio State University

Audrey B. Champagne

SUNY Albany

Marvin Druger

Syracuse University

Thomas P. Evans

Oregon State University

James J. Gallagher

Michigan State University

Robert W. Howe

Ohio State University

Heidi Kass

University of Alberta

Ronald J. Raven

E. Amherst, New York

James Stewart

University of Wisconsin

Robert L. Steiner

University of Puget Sound

Fletcher G. Watson

Belmont, Massachusetts

Warren T. Wollman

University of Rochester

Contributing Editors

M. B. Ogunniyi, *Western Africa*

R. S. Xu, *China*

H. Niedderer, *Central Europe*

A. D. Turner, *British Isles*

The *Science Teacher Education Section* is sponsored by the Association for the Education of Teachers in Science (AETS). The Editorial Review Board of AETS is composed of

Nasrine Adibe (1992)

Donald Daugs (1994)

Marvin Druger (1993)

Thomas P. Evans (1993, Chair)

Ray B. Hull (1994)

Keith Kennedy (1992)

Norman Lederman (1993)

Laura Rogers (1993)

Thomas G. Teates (1992)

Wallie Samiroden (1994)

Piyush Swami (1992)

Science Education (ISSN:0036-8326) is published six times yearly (January, April, June, July, September, November), one volume per year, by John Wiley & Sons, Inc. Copyright © 1991 by John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10158. All rights reserved. Reproduction or translation of any part of this work beyond that permitted by Sections 107 or 108 of the United States Copyright Law without the permission of the Copyright holder is unlawful. Second-class postage paid at New York, New York, and at additional mailing offices.

The code and the copyright notice appearing at the bottom of the first page of an article in this journal indicate the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients, on the condition that the copier pay for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. The per-copy fee for each article appears after the dollar sign and is to be paid through the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Such permission requests and other permission inquiries should be addressed to the Permissions Dept.

Subscription price 1991: \$135.00 per volume, \$196.00 per volume outside U.S.A. (including postage and handling). Please allow four weeks for change of address. Back volumes, microfilm, and microfiche available for previous years. Request price list from publisher. Claims for undelivered copies will only be accepted after the

following issue has been received. Please enclose mailing label. Missing copies will be supplied when losses have been sustained in transit and where reserve stock will permit.

Postmaster: Send address changes to *Science Education*, Susan Malawski, Fulfillment Manager, Subscription Department, John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10158. For subscription inquiries, please call customer service at (212) 850-6645 or write to the above address.

Advertising Sales: Inquiries concerning advertising should be forwarded to Roberta Frederick, Advertising Sales, John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10158: (212) 850-8832. Advertising Sales, European Contact: Michael Levermore, Advertising Sales Manager, John Wiley & Sons Ltd., Baffins Lane, Chichester, Sussex PO19 1UD, England.

Manuscripts should be submitted in quadruplicate to Dr. Leopold E. Klopfer, Editor, University of Pittsburgh, Learning Research and Development Center, 3939 O'Hara Street, Pittsburgh, Pennsylvania 15260. Information for contributors appears in the first and last issue of each volume.

Other correspondence: All other correspondence should be addressed to *Science Education*, Publisher, Interscience Division, Professional, Reference, and Trade Group, John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10158.

The Contents of this journal are indexed in the following: *Current Contents/Social and Behavioral Sciences*, *Current Index to Journals in Education*, *Education Index*, *Investigations in Science Education*, *Research into Higher Education Abstracts*, and *Social Sciences Citation Index*.

SCIENCE EDUCATION

CONTENTS

Issue 1, January

INTERNATIONAL CONFERENCE ON THE HISTORY AND PHILOSOPHY OF SCIENCE AND SCIENCE TEACHING

C. D. Gruender and K. G. Tobin, Guest Editors

Promise and Prospect

C. D. Gruender and K. G. Tobin 1

Constructivist Perspectives on Science and Mathematics Learning

G. H. Wheatley 9

Analogies from the Philosophy and Sociology of Science for Understanding Classroom Life

P. Cobb, T. Wood, and Y. Yackel 23

Alternative Conceptions and History of Science in Physics Teacher Education

M. Sequeira and L. Leite 45

Anthropomorphism and Teleology in Reasoning about Biological Phenomena

P. Tamir and A. Zohar 57

Using an Historical Perspective to Enrich the Teaching of Linkage in Genetics

J. F. Kinnear 69

Science Education, Philosophy of Science, and Scientific Prejudice

C. Ray 87

Teaching About the Nature of Science in the British National Curriculum

J. Solomon 95

Extending the Conception of "Problem" in Problem Solving Research

J. Stewart and R. Hafner 105

Perspective and Practicing Secondary School Science Teachers' Knowledge and Beliefs about the Philosophy of Science

J. J. Gallagher 121

Beginning Teachers' Knowledge of and Attitude Toward History and Philosophy of Science

B. B. King 135

740 VOLUME CONTENTS

Teaching History and Nature of Science in Science Courses:

A Rationale

- R. W. Bybee, J. C. Powell, J. D. Ellis, J. R. Giese, L. Parisi, and L. Singleton 143

Science Education Outstanding Paper Awards 157

Issue 2, April

Gender Differences in Science Competitions

- G. Jones 159

SCIENCE TEACHER EDUCATION, *Thomas P. Evans, Section Editor*

Improving the Quality of Science Classroom Discourse on Controversial Issues

- A. N. Geddis 169

The Dynamic Interactions Among Beliefs, Role Metaphors, and Teaching Practices: A Case Study of Teacher Change

- C. Briscoe 185

ISSUES AND TRENDS, *Glen S. Aikenhead, Section Editor*

The Evolution-Creation Controversy: Opinions of Ohio School Board Presidents

- M. Zimmerman 201

LEARNING, *Warren T. Wollman, Section Editor*

Where Concepts Meet Percepts: Stimulating Analogical Thought in Children

- L. Flick 215

Cognitive Styles and Cognitive Structure

- C. J. McRobbie 231

INTERNATIONAL SCIENCE EDUCATION, *Heidi Kass and Ronald Raven, Section Editors*

The Development of Secondary School Science Curriculum in Malaysia

- S.-B. Tan 243

COMMENTS AND CRITICISMS

A Response to "Absorption, Refraction, Reflection: An Exploration of Beginning Science Teacher Thinking"

- D. B. Rosenthal 251

A Response to Rosenthal

- D. A. Roberts and A. M. Chastko 253

Issue 3, June

A SUMMARY OF RESEARCH IN SCIENCE EDUCATION—1989*Dale R. Baker*

Preface	v
Acknowledgements	vi
Introduction	255
Criteria and Ethics	255
Achievement in Science	256
Affect	268
Classroom Interactions	275
Cognitive Processes	277
Computers	288
Curriculum	297
Instruction	313
Legislation and Policy Issues	321
Misconceptions	323
Scientific Literacy	330
Teachers	333
Testing and Assessment	353
Textbooks and Text Comprehension	359
Women and Minorities in Science	367
References	371

Issue 4, July

The Reform Agenda and Science Education: Hegemonic Control vs. Counterhegemony

W. C. Kyle, Jr.	403
----------------------	-----

The Role of Research in Science Teaching: An NSTA Theme Paper

W. C. Kyle, Jr., M. C. Linn, B. L. Bitner, C. P. Mitchener, and B. Perry	413
--	-----

Science Vocabulary Knowledge of Third and Fifth Grade Students

M. J. Meyerson, M. S. Ford, W. P. Jones, and M. A. Ward	419
---	-----

Instructional Factors Related to Hearing Impaired Adolescents' Interest in Science

D. M. Mertens	429
---------------------	-----

742 VOLUME CONTENTS

SCIENCE TEACHER EDUCATION, *Thomas P. Evans, Section Editor*

- Metamorphosis, Adaptation, or Evolution?: Preservice Science Teachers' Concerns and Perceptions of Teaching and Planning**
N. G. Lederman and J. Gess-Newsome 443

ISSUES & TRENDS, *Glen S. Aikenhead, Section Editor*

- Towards an STS School Curriculum**
C. P. McFadden 457

LEARNING, *Warren T. Wollman, Section Editor*

- Components of Interesting Science Experiments**
M. E. Martinez and E. Haertel 471

COMMENTS AND CRITICISMS

- Constructivism and Domains of Scientific Knowledge: A Reply to Lythcott and Duschl**
A. E. Lawson 481
- Criticism of "Differential Treatment of Students by Middle School Science Teachers: Unintended Cultural Bias"**
E. A. Finkel 489
- Author's Response to Finkel's Criticism**
O. Lee 491

Issue 5, September

- Selective Traditions and the Science Curriculum: Eugenics and the Biology Textbook, 1914-1949**
S. Selden 493

SCIENCE EDUCATION ASSESSMENT INSTRUMENTS

- The Measurement of Students' Attitudes Towards Scientific Field Trips**
N. Orion and A. Hofstein 513
- Science Attitude Scale for Middle School Students**
F. L. Misiti, Jr., R. L. Shrigley, and L. Hanson 525

SCIENCE TEACHER EDUCATION, *Thomas P. Evans, Section Editor*

- Teachers' Beliefs and Views on Selected Science-Technology-Society Topics: A Probe into STS Literacy Versus Indoctrination**
U. Zoller, S. Donn, R. Wild, and P. Beckett 541

VOLUME CONTENTS 743

ISSUES AND TRENDS, *Glen S. Aikenhead, Section Editor*

Science Education and the Reawakening of the General Education

Ideal

P. S. Hlebowitsh and S. E. Hudson 563

Science and Aesthetics: A Partnership for Science Education

M. C. Flannery 577

LEARNING, *Warren T. Wollman, Section Editor*

Sink or Float—What Do the Experts Think?: The Historical Development of Explanations for Floatation

J. Snir 595

Issue 6, November

Editorial: Seventy-Five Years of *Science Education*

L. E. Klopfer 611

Enrollment in Advanced Science Courses in the USA

R. L. Doran 613

SCIENCE TEACHER EDUCATION, *Thomas P. Evans, Section Editor*

The Influence of Program Format on the Professional Development of Science Teachers: Teacher Perceptions of AP and Honors Science Courses

N. E. Herr 619

LEARNING, *Warren T. Wollman, Section Editor*

Effects of New Biology Teachers' Subject-Matter Knowledge on Curricular Planning

W. S. Carlsen 631

On the Role of Analogies and Metaphors in Learning Science

R. Duit 649

Questioning Levels of Junior High School Science Textbooks and Their Implications for Learning Textual Information

D. P. Shepardson and E. L. Pizzini 673

INTERNATIONAL SCIENCE EDUCATION, *Heidi Kass and Ronald Raven, Section Editors*

"Because I Am a Woman": A Study of Culture, School, and Futures in Science

M. Ndunda and H. Munby 683

744 VOLUME CONTENTS

Computers and the Learning of Biological Concepts: Attitudes and Achievement of Nigerian Students

O. J. Jegede, P. A. Okebukola, and G. A. Ajewole 701

ISSUES AND TRENDS, *Glen S. Aikenhead, Section Head*

The Sharing of Personal Science and the Narrative Element in Science Education

B. E. Martin and W. Brouwer 707

Issues in Linking Research to Science Teaching

P. D. Hurd 723

COMMENTS AND CRITICISMS

Ghosts of Crisis Past or Guideposts for Tomorrow?

J. H. Woodburn 733

